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International Policy Coordination Mechanism with respect to the Moral Hazards of Financial Intermediaries

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Contents

1. Introduction	1
2. The Model	7
2.1 A benchmark case: welfare inefficiency of informational barriers in financial markets without cross-border externalities	8
3. Welfare inefficiency of informational barriers in financial markets with cross-border externalities	14
4. International policy coordination to reduce the moral hazard of financial intermediaries under cross-border externalities	17
5. Concluding remarks and implications	24
References	27

International Policy Coordination Mechanism with respect to the Moral Hazards of Financial Intermediaries

This paper examines the impact of cross-border financial externalities on moral hazards of the banking sector, and an international policy coordination mechanism to reduce the moral hazards of the banking sector considering cross-border financial externalities. We demonstrate that the moral hazard of banking, such as reducing the monitoring efforts, is aggravated by cross-border financial externalities, while the introduction of an international policy coordination mechanism might reduce the moral hazard caused by these externalities.

Moreover, international policy coordination is less likely to be sustained when the policy maker is short-sighted and the banking sector has greater political influence. However, when the distortionary cost of a liquidity aids policy is lower with high administrative transparency, and cross-border financial externality is greater, the coordination mechanism is more likely to be sustained.

The results imply that efforts to launch an effective international financial coordination mechanism should start with countries with higher administrative transparency, more political stability, and enhanced financial integration.

Keywords: International Policy Coordination, Informational Barriers, Moral Hazards, Cross-border Financial Externalities

JEL Classification: F42, F50, F59

1. Introduction

The latest global financial crisis initiated by the collapse of the US mortgage market in 2007 has changed the basic policy approach of fixing the financial problems of each economy, including the cases of insolvency and liquidity crises. The most spectacular feature of the change in policy approach after the latest crisis is the considerable attention to the formation of an effective international financial policy coordination mechanism, as was the case with the G20 meeting, which was suggested by the US as a first attempt to overcome the global financial crisis.

Although the trough of the economic downturn following the global financial crisis is considered to have been passed, and an exit strategy is discussed often, the introduction of a stable international financial system that can prevent recurrent financial crises that are aggravated by self-fulfilling liquidity runs is the foremost issue to be resolved in ongoing discussions in G20 meetings. Following the Asian financial crisis in the late 1990s, the major policy approaches to fix the financial system have been austerity programs focused on correcting the so-called economic fundamentals by reducing budget deficits and restructuring the corporate sector and real economies based on high interest-rate policies. There has been a prolonged and intense debate on the effectiveness of such austerity programs, especially in terms of whether such programs aggravated Asian economies that were hit mainly by a liquidity crisis instead of an insolvency crisis.

Following repeated experiences of various types of liquidity crisis, the recent global financial crisis has confirmed the necessity of introducing a policy measure to fix and prevent liquidity crises caused by self-fulfilling liquidity runs. As a policy measure to handle a liquidity crisis in an individual banking sector or at the level of a national economy, the role of contingent liquidity

support has been emphasized as having catalytic effects in preventing liquidity runs. Consequently, after the global financial crisis initiated by the collapse of the US financial system, emergency liquidity support was offered to troubled financial sectors at an unprecedented scale throughout the world's economies in 2008.

However, even full recovery from liquidity runs of the troubled banking sectors that were supported by the massive emergency liquidity aids, intense criticism has been raised against the increasing moral hazard of the supported banking sectors. The major argument goes that emergency liquidity support gives a wrong signal to the banking sectors that did not undertake proper monitoring efforts by actually compensating their wrongdoings. Moreover, as most financial intermediaries operate as multinational financial institutions, a single country's tough financial measure to reduce the moral hazard of its banking sector is highly likely to end up with an adverse effect through the banking sectors' strategy of relocation to other countries with looser regulation.

These latest developments have re-emphasized the necessity of introducing effective international financial policy coordination mechanisms that might prevent liquidity crises due to self-fulfilling liquidity runs, while reducing the moral hazard of the supported banking sectors. Notwithstanding the need to introduce an international policy coordination mechanism, the differences between each individual country's political interests work as a tough barrier in delivering a working coordination mechanism, as has been observed in discussions in the recent G20 meeting.

Motivated by this background, this paper examines the impact of cross-border financial externalities on the moral hazards of the banking sector, and the effectiveness of international policy coordination in reducing these moral hazards. Moreover, we study the influence of political economic factors and country-specific characteristics on the sustainability of international financial policy coordination.

Numerous studies have tackled the issues of structuring a financial system to prevent liquidity crises in addition to handling the moral hazard of the involved financial sectors. Morris and Shin (2006) argue that bailouts that reduce ex post inefficiency will sometimes enhance the incentives for governments to take costly adjustment efforts based on a model of debt crisis caused by creditor coordination failure. Assuming a non-monotonous objective function of the IMF, the authors show that for catalytic finance to work, the IMF's decision should be a strategic complement to the adjustment effort of the decision country and the roll-over decisions of the private sector. The authors argue that catalytic finance is most likely to work when the fundamentals are quite poor, but not hopelessly so. In such a situation, the existence of IMF assistance provides just enough of a lifeline for the debtor country to make the necessary adjustment effort. At the same time, over some ranges of the fundamentals, conventional 'debtor moral hazard' effects may predominate.

Ghosal and Miller (2003) study a model of sovereign debt crises that combines the problems of creditor coordination and debtor moral hazard. In the face of sovereign default, the need to give appropriate incentives to the debtor leads to excessive 'rollover failures' by the creditors. The authors examine how the incidence of crises might be reduced by international sovereign bankruptcy procedures such as increased 'contractibility' of the sovereign debtor's payoffs,

suspension of convertibility in the discovery phase, and penalties in the case of malfeasance. In addition, the authors determine the role of moral hazard on the part of the “sovereign debtor” when roll-over is guaranteed by creditors; thus, efforts to prepare the debtor to pay back the principal and interest are diminished.

Corsetti, Guimaraes, and Roubini (2006) analyze the trade-off between official liquidity provision and debtor moral hazard in international financial crises, and demonstrate that limited contingent liquidity support helps to prevent liquidity runs. In addition, they identify circumstances in which official lending provides incentives to implement desirable but costly policies rather than causing moral hazard to debtors.

In a similar context, in a study based on global game approaches whilst focusing on the catalytic effects of liquidity support, Rochet and Vives (2006) try to provide a theoretical foundation for rescuing Bagehot’s view of the Lender of Last Resort. They show a unique Bayesian equilibrium where a solvent bank cannot find liquidity assistance, and argue that a public bailout and private bail-in involvement are complementary in implementing an incentive-efficient solution.¹

While prior literature has made significant progress in understanding mechanisms for the catalytic effects of liquidity support, an international policy coordination mechanism supporting efficient liquidity aids has not been determined. In addition, the effects of cross-border financial externalities due to the multinational banking operations of the majority of the financial

¹ See Chang and Velasco (2001), Cole and Kehoe (1996), and Diamond and Dybvig (1983) for variants of the open-economy model of self-fulfilling runs and Cottarelli and Giannini (2002), Mody and Saravia (2003), and Roubini and Setser (2004) for empirical evidence of catalytic finance after liquidity crises. See Morris and Shin (2003) for a general introduction to the global game that explains how liquidity support can have catalytic effects.

intermediaries have not been understood in an explicit way. Motivated by these unresolved issues, we examine the impact of financial cross-border externalities on the moral hazard of the banking sector, and the conditions for effective international financial policy coordination in reducing the moral hazard of the banking sector.

Based on a simple model assuming supermodularity between the domestic banking sector's monitoring effort and that of the foreign banking sector in affecting financial stability, we examine the role of international policy coordination in reducing moral hazards. Moreover, the impact of political economic factors on international policy coordination is determined.

We demonstrate that when the banking sector's level of monitoring effort cannot be observed, the required level of liquidity aids from the government is increased to induce an optimal level of monitoring effort as a result of the moral hazard of the banking sector. Moreover, when there is cross-border financial externality, the moral hazard of the financial sector is aggravated. However, when each country introduces coordinated liquidity aids policies, the moral hazard of the banking sector under cross-border externality can be reduced. Nonetheless, the condition for sustainable international policy coordination is dependent on various factors including political economic factors.

When the government takes a long-term policy approach with a higher discount factor, international policy coordination is more likely to be sustained with larger political influence of the banking sector. However, when the government takes a short-sighted approach with a lower discount factor, policy coordination is less likely with larger political influence of the banking sector because the government is concerned with the short-term profit of the banking sector under lower monitoring efforts. Moreover, international policy coordination is less likely to be sustained

with higher distortionary costs of the liquidity aids policy, such as higher transaction costs in the policy implementation process due to lower administrative transparency. In addition, when the cross-border financial externality is higher, international policy coordination is more likely because the gains from coordination dominate over the gains from deviation from coordination.

The results obtained in this study implicate that an effort to arrange an effective international policy coordination mechanism is essential to fix financial market failure due to cross-border externalities with informational barriers. However, the introduction of an effective international policy coordination mechanism is more likely among countries that have far-sighted policy approaches with stable political regimes. Moreover, coordination between countries with more integrated financial markets, and higher administrative transparency, which can reduce policy distortions, are more likely to be sustained. Therefore, efforts to form a financial coordination mechanism should commence between countries with higher political stability and transparency and more integrated financial markets. This implies that efforts to form an international coordination mechanism among asymmetric countries with political instability and high administrative transaction costs are highly likely to end up disappointingly.

The paper is organized as follows. Section 2 describes the model including the benchmarking case without cross-border externalities, and Section 3 determines the impact of cross-border externalities on the moral hazard of the banking sector under informational barriers. Section 4 studies the role of international policy coordination in reducing the moral hazard of the banking sector that is aggravated by cross-border externalities, and the conditions for an international financial policy coordination mechanism to work sustainably. Section 5 concludes the paper with a discussion.

2. The Model

We consider a case where there are two countries where a representative banking sector is regulated by the government in each country. The government in each country maximizes the political social welfare that is composed of financial stability, the domestic banking sector's profit, and the social cost to prevent a financial crisis. Financial stability is affected by two factors, i.e., the monitoring efforts of the banking sector, e , and an external macroeconomic shock. The exact configuration of the macroeconomic shock is not observed; therefore, the actual financial stability is represented as having a statistical distribution with a conditional probability density function, $f(p_i|e_i)$.

To achieve financial and macroeconomic stability, the government might work as a safety valve by providing emergency liquidity aids when the banking sector is hit by a serious external shock. In the financial sector, a self-fulfilling liquidity run might induce a serious credit crunch and destabilize the whole economy. Therefore, the government has a strong incentive to provide an emergency liquidity support to prevent a self-fulfilling liquidity run and the resulting credit crunch.

As noted before, the general financial stability is affected by the monitoring efforts of the banking sector in addition to other implied macroeconomic shocks while the actual level of the banking sector cannot be observed by the government. However, the profit level of the banking sector can be observed by the government. The government knows that when the available liquidity of the banking sector, the profit, and the liquidity aids, are smaller than the required payments, the banking sector faces a default crisis, which in turn might trigger a credit crunch in the economy.

The structure of the policy game is as follows. In the first stage, the government announces the financial policy as an emergency liquidity support, based on the observable profit of the banking sector, to prevent a credit crunch in the financial system. In the second stage, the banking sector decides its level of monitoring effort to maximize its profit considering the cost and profit-enhancing effects of the monitoring effort that enhances financial stability. In the third stage, the government takes actions regarding emergency liquidity support based on the policy announced in the first stage. The international financial coordination policy is also announced at the first stage. We consider the general case where the banking sector has a risk-averse preference, while the government is a risk-neutral social welfare maximizer.

2.1 A benchmark case: welfare inefficiency of informational barriers in financial markets without cross-border externalities

The government maximizes the social welfare function defined as follows:

$$\text{Max}_{S_i} SW_i = \int \left(p_i(e_i) + \gamma_i \prod_{B_i} -\psi_i S_i \left(\prod_{B_i} \right) \right) f(p|e_i) dp \quad \text{where } i = h \text{ or } f \quad (1)$$

where $p(e_i)$ represents the level of financial stability, in which e represents the level of monitoring effort of the banking sector. Further, the distribution of the financial stability is determined by the probability density function, $f(p_i|e_i)$. S_i represents the liquidity aids, the strategic variable of the government, based on the observed profit level of the banking sector.²

The rate of distortion from governmental intervention is represented by the value of ψ . If $\psi > 1$, the

² Although the financial stability, represented as $p(e_i)$, is assumed to be positively affected by the banking sector's efforts with the probability density function $f(p_i|e_i)$, it takes discrete feature collapsing to 0 when the banking sector defaults with the resulted liquidity trap. The role of liquidity aids, S_i , is to maximize the social welfare by preventing the financial stability from collapsing to 0 due to the default crisis and liquidity trap.

welfare loss from government intervention is larger than the possible gains from intervention mainly due to the high administrative costs of intervention.³

The profit of the banking sector is defined as follows. The variable representing financial market stability, $p(e_i)$, can be interpreted as the likelihood of the bank's getting a return of R per unit of loans.

The expected profit of the banking sector without government intervention is defined as follows:

$$\text{Max}_{e_i} \prod_i = \int p(e_i) R L f(p|e_i) dp - c(e_i) \quad (2)$$

where $p(e_i)$ represents the level of financial stability as a function of the banking sector's monitoring effort and economic fundamentals.⁴

The banking sector's available liquidity is composed of its current profit and governmental provision of liquidity when the government provides an emergency liquidity aid as follows:

$$M = \int p(e_i) R L f(p|e_i) dp - c(e_i) + S_i \quad (3)$$

where S_i is the emergency liquidity aid from government i .

³ The actual outcome of financial stability is affected not only by the banking sector's monitoring efforts but also by the economic fundamentals and other external factors. Therefore, the relationship between actual financial stability and the banking sector's monitoring efforts can be described linearly. However, the first derivative of financial stability with respect to the banking sector's monitoring efforts is always positive as follows: $p'(e_i) > 0$.

⁴ To show the risk aversion of the banking sector, we might assume the concavity of the banking sector's utility function as follows: $U_i(\prod_i) = (\prod_i)^{1/\alpha}$, where the utility is risk averse if $\alpha > 1$. If the value of α is higher, we can say that the absolute rate of risk aversion is increasing because the absolute rate of risk aversion is:

$$RARV = -\frac{U''}{U'} = (a-1/a)(\prod_i)^{-1} \rightarrow \frac{\partial((a-1/a)(\prod_i)^{-1})}{\partial a} = a^{-2}(\prod_i)^{-1} > 0.$$

The banking sector might collapse to a default crisis when the available liquidity is lower than the debt service requirements. The debt service requirement is composed of the interest payment requirement on the outstanding debt such as deposits and the short-term debt, which is denied rolled-over, as follows:

$$D = I + lT,$$

where I is the interest payment on the outstanding debt, l is the proportion of short-term creditors who decline to roll over, and T is the amount of short-term debt.

The banking sector's default crisis occurs when its available liquidity is smaller than the required liquidity for debt payment, as shown below:

$$M = \int p(e_i) R L f(p|e_i) dp - c(e_i) + S_i < D = I + lT. \quad (4)$$

We assume that if condition (4) is not satisfied, the banking sector suffers a default crisis with the deluge of failures in the roll-over of short-term debt due to herd behavior as in the case of the global game.⁵

When the banking sector's monitoring effort can be observed, the equilibrium in the financial sector is defined with an optimal mechanism that induces the social welfare-maximizing level of effort of the banking sector that enforces the optimal level of effort through the contract. The equilibrium under complete information about the banking sector's monitoring effort is defined as follows:

The government decides the optimal policy to maximize the political objective function that is defined as follows:

⁵ Refer Morris and Shin (2006), Corsetti et al. (2006), and Rochet and Vives (2004) for details of the global game structure that causes a default crisis due to possible herd behavior in financial markets.

$$\text{Max}_{S_i} SW_i = \int \left(p_i(e_i) + \gamma_i \prod_{B_i} -\psi_i S_i(\prod_{B_i}) \right) f(p|e_i) dp \quad (5)$$

$$\text{such that } \int U(S_i)(p|e_i) dp - c(e_i) \geq \bar{U}$$

where $i = h$ or f and U is the utility function of the banking sector given the profit level of the banking sector.

The equilibrium financial policy should satisfy the following first-order condition of the social welfare maximization problem with the individual rationality condition for the banking sector being satisfied:

$$\psi_i f(p|e_i) - \mu U'(S_i(\prod_i)) f(p|e_i) = 0 \quad (6)$$

$$\text{which can be reformulated to } \frac{1}{U'(S_i(\prod_i))} = \frac{\mu}{\psi_i},$$

where μ is the shadow price of the individual rationality condition of the banking sector in investing effort in monitoring.

Now, we examine the case when the banking sector's monitoring effort cannot be observed. As is well known, when the banking sector is risk-neutral, the equilibrium is equivalent to the case of complete information, because the banking sector will choose the social welfare-maximizing monitoring effort when the fixed amount of transfer to the government regulator is properly set. Therefore, we examine the case when the banking sector has a risk-averse utility function.

Because the monitoring effort involves the monitoring cost, which is convex in the effort, the banking sector tends to minimize its effort as long as the reservation payoff is guaranteed. However, the social welfare can be improved with a higher level of monitoring effort. Therefore, when the banking sector has a risk-averse utility function, welfare inefficiency is observed due to

the conflicting interests of the government regulator and the banking sector. Given the informational problem, the optimal financial system that implements the socially optimal monitoring effort of the banking sector is defined as follows:

$$\text{Max}_{e_i, S_i} SW_i = \int \left(p_i(e_i) + \gamma_i \prod_{B_i} - \psi_i S_i(\prod_{B_i}) \right) f(p|e_i) dp \quad (7)$$

$$\text{such that i) } \int U(S_i(\prod_i))(p|e_{Hi}) dp - c(e_{Hi}) \geq \bar{U}$$

$$\text{ii) } \int U(S_i(\prod_i))(p|e_{Hi}) dp - c(e_{Hi}) \geq \int U(S_i(\prod_i))(p|e_{Li}) dp - c(e_{Li})$$

where $i = h$ or f

An efficient financial regulatory system is characterized as a system that satisfies the incentive compatibility condition, (ii), which induces a socially optimal level of monitoring effort of the banking sector in addition to the individual rationality condition, i), that guarantees the banking sector the reservation payoff even if the banking sector commits a socially optimal level of monitoring effort.

The optimal financial system should satisfy the following first-order condition of the government's political optimization problem:

$$\psi_i f(p|e_{Hi}) - \mu U'(S_i(\prod_i)) f(p|e_{Hi}) - \phi (f(p|e_{Hi}) - f(p|e_{Li})) U'(S_i(\prod_i)) = 0$$

where $i = h$ or f and μ and ϕ are the shadow prices of the individual rationality condition and the incentive compatibility condition of the banking sector, respectively.

The above first-order condition can be summarized as follows:

$$\frac{\psi_i}{U'(S_i(\prod_i))} = \mu + \phi \left(1 - \frac{f(p|e_{Li})}{f(p|e_{Hi})} \right). \quad (8)$$

When there is no informational barrier as in the case of asymmetric information about the level of effort of the banking sector, the optimal financial regulatory system is a fixed amount of the government subsidy based on the banking sector's level of effort, as shown in Eq. (6).

However, when there is an informational barrier due to asymmetric information, the equilibrium financial system is characterized by additional expenditure as an incentive to the banking sector to expend further effort in monitoring compared to the case of symmetric information as shown below:

The financial stability of an economy monotonously increases with the monitoring effort; therefore, the probability density function of economic stability with respect to a higher effort level (e_H) is always greater than that in the case of a lower level of effort (e_L): $f(p|e_L) < f(p|e_H)$.

Therefore, the second term in the right-hand side of Eq. (8), $\phi \left(1 - \frac{f(p|e_L)}{f(p|e_H)} \right)$, is always positive implying that $S_i(\prod_i) > \tilde{S}_i$, where \tilde{S}_i denotes the optimal level of emergency liquidity support from the government when there is no informational barrier. In other words, informational barriers cause higher expenditure on emergency liquidity support on the part of the government to induce a socially optimal level of monitoring effort on the part of the banking sector.

When more government support is required to induce the banking sector to expend a socially optimal level of monitoring effort, one can interpret this as a source of moral hazard due to informational barriers because the banking sector tends to expend less monitoring effort when there are informational barriers than the case of symmetric information. The level of inefficiency is clear given that the expected value of emergency liquidity aid on the part of the government (S_{IH}^*)

is strictly larger than the amount of emergency liquidity aid required under complete information, $S_{IH_i}^* = U^{-1}(\bar{u} + c(e_{Hi}))$.

Due to the concavity of the banking sector's utility function, the value or utility to the banking sector from the expected profit including the government liquidity aid is higher than the expected value from the profit under uncertainty. Therefore, the expected amount of emergency liquidity aid that induces a socially optimal level of monitoring effort on the part of the banking sector under informational barriers is larger than the level of liquidity aid required under complete information as follows⁶:

$$E[S_{IH_i}^*(\prod_i) | e_{Hi}] > S_{CH_i}^*(\prod_i).$$

The findings from the above discussion can be summarized as Proposition 1.

Proposition 1. *When there are informational barriers to the monitoring effort made by the banking sector, the level of liquidity aid required to maintain financial stability is increased. Moreover, at the given level of liquidity aid, the level of monitoring effort of the banking sector is reduced under informational barriers, which can be labeled as the moral hazard caused by informational barriers to the banking sector's efforts.*

3. Welfare inefficiency of informational barriers in financial markets with cross-border externalities

When there are two countries, country i and country j , and the monitoring-effort level of the banking sector in country j influences the financial stability of country i or vice versa, cross-border

⁶ It should be noted that the functional relationship between the realized profit of the banking sector and the liquidity aids provided by the government is not monotonous. The optimal liquidity aids provides the highest welfare by preventing the liquidity trap considering the convex social cost of the liquidity aids. As a result, the optimal level of the liquidity aids satisfies the binding condition to prevent the default crisis of the representative banking sector. Therefore, it is self-evident that the amount of liquidity aids does not increase with the banking sector's profit level in monotonic fashion.

externalities are observed in the financial market. Strategic complementarity is observed between the monitoring effort of the domestic banking sector and that of the foreign banking sector with respect to their impacts on financial stability, as observed in the supermodular game as follows:

$$\frac{\partial^2 p_i(e_i, \beta e_j)}{\partial e_i \partial e_j} > 0 \quad \text{and} \quad \frac{\partial^2 p_i(e_i, \beta e_j)}{\partial e_j \partial e_i} > 0.$$

When cross-border externalities are observed in the financial market via the indirect impacts of the monitoring efforts of foreign banking sectors on domestic financial stability, the social welfare maximization problem is defined as follows:

$$\text{Max}_{e_i, S_i} SW_i = \int \left(p_i(e_i, \beta e_j) + \gamma_i \prod_{Bi} (p_i(e_i, \beta e_j)) - \psi_i S_i \left(\prod_{Bi} (p_i(e_i, \beta e_j)) \right) \right) f(p|e_i) dp \quad (9)$$

$$\text{such that i) } \int U \left(S_i \left(\prod_i (e_i, \beta e_j) \right) \right) (p|e_{Hi}) dp - c(e_{Hi}) \geq \bar{U}$$

$$\text{ii) } \int U \left(S_i \left(\prod_i (e_i, \beta e_j) \right) \right) (p|e_{Hi}) dp - c(e_{Hi}) \geq \int U \left(S_i \left(\prod_i (e_i, \beta e_j) \right) \right) (p|e_{Li}) dp - c(e_{Li})$$

where $p(e_i, \beta e_j)$ is the financial stability as a function of the foreign banking sector's monitoring effort in addition to the domestic banking sector's monitoring effort, as a result of cross-border externalities in the financial market. There is a strategic complementarity between the domestic monitoring effort, e_i , and foreign monitoring effort, e_j . The scale of the cross-border externality is seen through the parameter β .

The optimal financial mechanism under cross-border externalities should satisfy the first-order condition of the social welfare-maximization problem with the individual rationality condition and the incentive compatibility condition being satisfied simultaneously. When the domestic social welfare is positively affected by the monitoring effort of a foreign banking sector as a strategic complementary variable, the equilibrium emergency aid is distorted downward when

compared to the case of no cross-border externalities. The first-order condition is defined as follows:

$$\psi_i f(p|e_{Hi}) - \mu U'(S_i(\prod_i(e_{Hi}, \beta e_j))) f(p|e_{Hi}) - \phi (f(p|e_{Hi}) - f(p|e_{Li})) U'(S_i(\prod_i(e_{Hi}, \beta e_j))) = 0$$

which can be rewritten as
$$\frac{\psi_i}{U'(S_i(\prod_i(e_{Hi}, e_j)))} = \mu + \phi \left(1 - \frac{f(p|e_{Li}, e_j)}{f(p|e_{Hi}, e_j)} \right) \quad (10)$$

Here, we can see that when there are cross-border externalities in the financial market, the marginal utility from additional emergency liquidity aid is lowered since the benefit from domestic liquidity aid spills over to the foreign country: $U'_i(S_i(\prod_i(e_{Hi}, e_j))) < U'_i(S_i(\prod_i(e_{Hi})))$.

The above result is confirmed with the impact of cross-border externalities on financial stability as follows. Financial stability is supposed to increase with monitoring effort. However, when there is cross-border externality in the financial market, the rate of increase in financial stability with the monitoring effort is lower than in the case of no cross-border externality, as shown below⁷:

$$\frac{f(p|e_{Li})}{f(p|e_{Hi})} > \frac{f(p|e_{Li}, e_j)}{f(p|e_{Hi}, e_j)} \quad \text{or} \quad \left(1 - \frac{f(p|e_{Li}, e_j)}{f(p|e_{Hi}, e_j)} \right) > \left(1 - \frac{f(p|e_{Li})}{f(p|e_{Hi})} \right) \quad (11)$$

Therefore, we obtain inequality (12), which denotes that the equilibrium level of emergency liquidity aid is higher under cross-border externality than in the case of no cross-border externality.

$$\frac{\psi_i}{U'(S_i(\prod_i))} = \mu + \phi \left(1 - \frac{f(p|e_{Li})}{f(p|e_{Hi})} \right) < \frac{\psi_i}{U'_i(S_i(\prod_i(e_{Hi}, e_j)))} = \mu + \phi \left(1 - \frac{f(p|e_{Li}, e_j)}{f(p|e_{Hi}, e_j)} \right) \quad (12)$$

⁷ When the cross-border externalities in the financial markets are assumed, the supermodularity is observed between two countries' monitoring efforts. Therefore, the downward shift of probability density function of the financial stability with a higher monitoring effort level due to the cross-border externality is higher than the case of a lower effort level. This case can be represented as: $|f(p|e_{Hi}, e_j) - f(p|e_{Hi})| > |f(p|e_{Li}, e_j) - f(p|e_{Li})|$.

Eq. (12) implies that the level of monitoring effort of the banking sector under cross-border externalities is lower than in the case of no cross-border externalities. In other words, the existence of cross-border externalities aggravates the moral hazard problem caused by informational barriers.

The main finding of this section is summarized in Proposition 2.

Proposition 2. *When there is a cross-border externality, the required amount of liquidity aid from the government to achieve financial stability is increased in comparison to the case of no cross-border externality. The existence of cross-border externality aggravates the moral hazard problem due to informational barriers by inducing the banking sector to expend less monitoring effort than in the case of no cross-border externality.*

4. International policy coordination to reduce the moral hazard of financial intermediaries under cross-border externalities

With most banking sectors operating as multinational firms, cross-border externalities in the financial sector have expanded unprecedentedly as experienced in the latest global financial crisis initiated by the collapse of the US mortgage market. In this section, an international policy coordination mechanism to reduce the moral hazard of financial intermediaries under cross-border externalities is examined.

When countries i and j are coordinating their financial policies to reduce the moral hazards of their banking sectors by setting a coordinated level of liquidity aid to induce the optimal level of monitoring effort, the aggravated moral hazard problem under cross-border externality is resolved as follows:

When a foreign country coordinates its financial policy of providing liquidity aid to its financial sector to reduce the aggravated moral hazard problem due to cross-border externality, the relative probability density function of financial stability with respect to the low and high levels of monitoring effort is adjusted to the original level of the relative probability density function without the cross-border externality as follows⁸:

$$\frac{f(p|e_{Li})}{f(p|e_{Hi})} = \frac{f(p|e_{Li}(S_i^*), e_{Lj}(S_j^*))}{f(p|e_{Hi}(S_i^*), e_{Hj}(S_j^*))} > \frac{f(p|e_{Li}(S_i^*), e_j)}{f(p|e_{Hi}(S_i^*), e_j)}. \quad (13)$$

Therefore, the marginal utility from additional government liquidity aid with international coordination becomes equal to that in the case of no externality as follows:

$$U_i'(S_i(\prod_i(e_{Hi}, e_j))) < U_i'(S_i(\prod_i(e_{Hi}, e_{Hj}))) = U_i'(S_i(\prod_i(e_{Hi}))). \quad (14)$$

The above result implies that when the emergency liquidity policies are coordinated between country i and country j , the equilibrium level of emergency government aid required to induce the optimal levels of monitoring effort is lower than in the case without policy coordination. In other words, the level of moral hazard of the banking sector is reduced because the level of monitoring effort under international policy coordination is higher than in the case without policy coordination at the given government liquidity aid, as shown in Eq. (15). The result is summarized in Proposition 3.

⁸ When the social welfare function is symmetric between countries i and j , the optimal liquidity aid of the foreign government is equivalent to that in the case of the liquidity aid of country i , removing the incentive of the banking sector in each country to reduce its monitoring effort.

$$\frac{\psi_i}{U_i(S_i(\prod(e_H, e_H)))} \Big|_{S_i^*, S_j^*} = \mu + \phi \left(1 - \frac{f(p|e_{Li}, e_{Lj})}{f(p|e_{Hi}, e_{Hj})} \right) \Big|_{S_i^*, S_j^*} < \frac{\psi_i}{U_i(S_i(\prod(e_H, e_j)))} \Big|_{S_i^*, S_j=0} = \mu + \phi \left(1 - \frac{f(p|e_{Li}, e_{Lj})}{f(p|e_{Hi}, e_{Hj})} \right) \Big|_{S_i^*, S_j=0} \quad (15)$$

Proposition 3. *When the financial policies on emergency liquidity aids are coordinated among countries with cross-border externalities, the equilibrium level of liquidity aid is lowered compared to that in the case without policy coordination. This result implies that the moral hazard of the banking sector is reduced with international policy coordination; the level of monitoring effort of the banking sector is higher than in the case without policy coordination at the given liquidity aid.*

Although it is generally agreed that international policy coordination can enhance welfare efficiency in the financial sector especially when there are strong cross-border externalities, the actual introduction of a coordination mechanism is a different issue facing many unexpected political barriers. We examine the condition under which international policy coordination can be sustained considering possible asymmetry of the political-economic structures of countries connected with cross-border externalities in the financial sector. Financial policy coordination can be sustained only when the maximum payoff available by choosing to deviate from policy coordination is dominated by the payoff from abiding by international policy coordination, as defined in Eq. (16).

The minimum political economic social welfare from policy coordination should be higher than the maximum social welfare from deviation from the coordination, as shown below⁹:

⁹ It is assumed that each country takes tit-for-tat strategy in her liquidity aids policy making process. In equation (16), the incentive compatibility condition for the cooperative liquidity aids policy was considered focusing on the maximum deviation payoffs of home country while the foreign country abides by the tit-for-tat strategy. The case when the foreign country takes a non-cooperative strategy while the home country takes a cooperative strategy would be the opposite case. As long as the policy makers of both countries are rational, they examine the optimal strategy based on the equilibrium dominance test, and choose consistent policies, not a

$$SW_i(S_{Ni}, S_{Cj}) + \frac{\delta_i SW_i(S_{Ni}, S_{Nj})}{1 - \delta_i} < \frac{SW_i(S_{Ci}, S_{Cj})}{1 - \delta_i}. \quad (16)$$

The non-cooperative liquidity aid policy (S_{Ni}) is to choose the lowest level of government expenditure ending in a lower level of effort of the domestic banking sector taking consideration of cross-border effects in the financial sector, while the cooperative policy (S_{Ci}) is to induce a higher level of monitoring effort of the domestic banking sector to maximize the joint social welfare:

$$\begin{aligned} & \int \left(p_i(e_{Li}, \beta e_{Hj}) + \gamma_i \prod_{Bi} (p_i(e_{Li}, \beta e_{Hj})) - \psi_i S_i \left(\prod_{Bi} (p_i(e_{Li}, \beta e_{Hj})) \right) \right) f(p|e_i) dp \quad + \\ & \frac{\delta_i}{1 - \delta_i} \left(\int \left(p_i(e_{Li}, \beta e_{Lj}) + \gamma_i \prod_{Bi} (p_i(e_{Li}, \beta e_{Lj})) - \psi_i S_i \left(\prod_{Bi} (p_i(e_{Li}, \beta e_{Lj})) \right) \right) f(p|e_i) dp \right) \\ & < \frac{1}{1 - \delta_i} \left(\int \left(p_i(e_{Hi}, \beta e_{Hj}) + \gamma_i \prod_{Bi} (p_i(e_{Hi}, \beta e_{Hj})) - \psi_i S_i \left(\prod_{Bi} (p_i(e_{Hi}, \beta e_{Hj})) \right) \right) f(p|e_i) dp \right) \end{aligned}$$

The condition for international policy coordination for financial stability to be sustained can be examined by comparative static analysis of the policy coordination condition, viz., Eq. (16). Several factors influence the policy coordination condition such as the distortionary effect of the liquidity aid policy, the political economic influence of the banking sector, the scale of cross-border externalities, and the discount factor of each economy. For simplicity of analysis without losing generality, we normalize the parameters of the foreign country, and focus on the parameters of the domestic country. Then, we obtain the following results:

First, the impact of the political economic influence of the financial sector on the policy coordination mechanism is examined. The impact of the political economic influence commanded by the financial sector on the international policy coordination mechanism can be examined by

random choice of the strategy. In that case, the opposite case of foreign country's deviation is reduced to the same case of equation (16).

comparative static analysis of the international policy coordination condition with respect to the parameter representing the political economic factors in the policy decision making process, γ_i .

The comparative static analysis yields the following results:

$$\frac{\partial \left(\frac{SW_i(S_{Ci}, S_{Cj})}{1-\delta_i} - \frac{\delta_i SW_i(S_{Ni}, S_{Nj})}{1-\delta_i} - SW_i(S_{Ni}, S_{Cj}) \right)}{\partial \gamma_i} \quad (17)$$

$$= \frac{\delta_i \left(\prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Hj})) - \prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Nj})) \right) - \left(\prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Hj})) - \prod_{Bi} (p_i(e_{Hi}, \beta_i e_{Hj})) \right)}{1-\delta_i}$$

$$= \begin{cases} > 0 & \text{if } \delta_i > \tilde{\delta} \\ < 0 & \text{if } \delta_i < \tilde{\delta} \end{cases}$$

where $\tilde{\delta} = \frac{\prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Hj})) - \prod_{Bi} (p_i(e_{Hi}, \beta_i e_{Hj}))}{\prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Hj})) - \prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Nj}))}$

The above result implies that if the discount factor is larger than the critical value, the higher is the political economic influence commanded by the banking sector, the more likely is international policy coordination to be sustained. However, when the discount factor is lower than the critical value, international policy coordination is less likely with higher political influence of the banking sector. The intuition behind this result is that when the government takes a short-sighted policy approach, it chooses a non-cooperative Nash strategy. The non-cooperative policy implies a deviation from the policy coordination that induces less monitoring effort on the part of the domestic banking sector that seeks to maximize its short-term profits by extracting positive cross-border externalities.

Secondly, the impact of the distortionary effect of government financial intervention is examined with the following comparative static analysis:

$$\begin{aligned}
& \frac{\partial \left(\frac{SW_i(S_{Ci}, S_{Cj})}{1-\delta_i} - \frac{\delta_i SW_i(S_{Ni}, S_{Nj})}{1-\delta_i} - SW_i(S_{Ni}, S_{Cj}) \right)}{\partial \psi_i} \tag{18} \\
& = \\
& \frac{\left(\delta_i S_i \left(\prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Nj})) \right) + (1-\delta_i) S_i \left(\prod_{Bi} (p_i(e_{Ni}, \beta_i e_{Hj})) \right) - S_i \left(\prod_{Bi} (p_i(e_{Hi}, \beta_i e_{Hj})) \right) \right) f(p|e_i) dp}{1-\delta_i} \\
& = \\
& \frac{\left(S_i \left(\prod_{\mathbb{B}} (p_i(e_{Hi}, \beta_i e_{Hj})) \right) - S_i \left(\prod_{\mathbb{B}} (p_i(e_{Ni}, \beta_i e_{Hj})) \right) \right) + \delta_i \left(S_i \left(\prod_{\mathbb{B}} (p_i(e_{Ni}, \beta_i e_{Hj})) \right) - S_i \left(\prod_{\mathbb{B}} (p_i(e_{Ni}, \beta_i e_{Nj})) \right) \right) f(p|e_i) \phi}{1-\delta_i} < 0.
\end{aligned}$$

The above result implies that when the distortionary cost of the liquidity support policy is higher, it is less likely that the policy coordination is sustained. The distortionary cost can be interpreted as a transaction cost in the process of policy implementation, and in that context, when the economic system efficiency is lower, as in the case of low transparency in the administrative process, financial policy coordination is less likely.

Finally, the impact of the scale of cross-border externalities on policy coordination is determined by the sign and scale of the partial derivative (Eq. (19)):

$$\frac{\partial \left(\frac{SW_i(S_{Ci}, S_{Cj})}{1-\delta_i} - \frac{\delta_i SW_i(S_{Ni}, S_{Nj})}{1-\delta_i} - SW_i(S_{Ni}, S_{Cj}) \right)}{\partial \beta_i} \tag{19}$$

Eq. (19) is equivalent to the following equation:

$$\frac{\partial \left(\frac{1}{1-\delta_i} \left(\int (p_i(e_{Hi}, \beta_i e_{Hj}) + \gamma_i \prod_{Bi} (p_i(e_{Hi}, \beta_i e_{Hj})) - \psi_i S_i(\prod_{Bi} (p_i(e_{Hi}, \beta_i e_{Hj}))) f(p|e_i) dp \right) \right)}{\partial \beta_i}$$

$$\frac{\partial \left(\frac{\delta_i}{1-\delta_i} \left(\int (p_i(e_{Li}, \beta_i e_{Lj}) + \gamma_i \prod_{Bi} (p_i(e_{Li}, \beta_i e_{Lj})) - \psi_i S_i(\prod_{Bi} (p_i(e_{Li}, \beta_i e_{Lj}))) f(p|e_i) dp \right) \right)}{\partial \beta_i}$$

$$\frac{\partial \left(\int (p_i(e_{Li}, \beta_i e_{Hj}) + \gamma_i \prod_{Bi} (p_i(e_{Li}, \beta_i e_{Hj})) - \psi_i S_i(\prod_{Bi} (p_i(e_{Li}, \beta_i e_{Hj}))) f(p|e_i) dp \right)}{\partial \beta_i}$$

The sign of the above term is determined as follows:

$$\begin{aligned} & \frac{1}{(1-\delta_i)} \underbrace{\frac{\partial \int (p_i(e_{Hi}, \beta_i e_{Hj}) - \delta_i p_i(e_{Li}, \beta_i e_{Lj}) - (1-\delta_i) p_i(e_{Li}, \beta_i e_{Hj})) f(p|e_i) dp}{\partial \beta_i}}_{+} + \\ & \frac{\gamma_i}{(1-\delta_i)} \underbrace{\frac{\partial \int (\prod_i p_i(e_{Hi}, \beta_i e_{Hj}) - \delta_i \prod_i p_i(e_{Li}, \beta_i e_{Lj}) - (1-\delta_i) \prod_i p_i(e_{Li}, \beta_i e_{Hj})) f(p|e_i) dp}{\partial \beta_i}}_{+} + \\ & \frac{\psi_i}{(1-\delta_i)} \underbrace{\frac{\partial \int ((1-\delta_i) S_i(\prod_i p_i(e_{Li}, \beta_i e_{Hj})) + \delta_i S_i(\prod_i p_i(e_{Li}, \beta_i e_{Lj})) - S_i(\prod_i p_i(e_{Hi}, \beta_i e_{Hj}))) f(p|e_i) dp}{\partial \beta_i}}_{+} > 0 \end{aligned}$$

The above result implies that when the rate of cross-border externality is higher, it is more likely that international policy coordination is sustained. The intuition behind this result is straightforward in the sense that the benefit from abiding by coordination dominates over the benefit from deviation as a larger financial cross-border externality increases the strategic complementarities of the monitoring efforts of the banking sectors in both countries.

The findings in the above discussion are summarized in Proposition 4.

Proposition 4.

i) When the government takes a far-sighted policy approach with a higher discount factor, international policy coordination is more likely to be sustained with larger political influence being commanded by the banking sector. However, when the policy maker takes a short-sighted approach with a lower discount factor, international policy coordination is less likely with larger political influence of the banking sector because the government is concerned with the banking sector's short-term profit and lower monitoring effort.

ii) When the distortionary cost of the liquidity aid is higher, international policy coordination is less likely to be sustained, implying that policy coordination is difficult to sustain when the transaction cost in the policy implementation process is higher due to low administrative transparency.

iii) When the cross-border financial externality is higher, international policy coordination is more likely to be sustained because the benefit from coordination dominates over the payoff from deviation from policy coordination.

5. Concluding remarks and implications

This paper has examined the impact of cross-border financial externality on the moral hazard of the banking sector, while the government seeks to maximize the political social welfare including the financial stability and surplus of each sector. Based on a simple model that assumes supermodularity between the domestic banking sector's monitoring effort and that of the foreign banking sector in terms of the impact on financial stability, we have determined the effect of international policy coordination in reducing moral hazards. Moreover, the impact of political economic factors on international policy coordination has been studied.

It has been shown that when the banking sector's level of monitoring effort cannot be observed by the government, the required level of liquidity aid from the government is increased to induce an optimal level of monitoring effort as a result of the moral hazard of the banking sector.

Moreover, when there is cross-border financial externality, the moral hazard of the financial sector is aggravated.

However, when the respective countries introduce coordinated financial policies as a jointly coordinated liquidity-aid policy, the moral hazard under cross-border externality can be reduced. Nonetheless, the condition for international policy coordination to be sustained is dependent on various factors including political economic factors. When the government takes a long-term approach with a higher discount factor, international policy coordination is more likely to be sustained with larger political influence of the banking sector. However, when the government takes a short-sighted approach with a lower discount factor, policy coordination is less likely with larger political influence of the banking sector because the government is concerned with the short-term profit of the banking sector and lower monitoring effort.

Moreover, policy coordination is less likely with the higher distortionary cost of the liquidity-aid policy, such as a higher transaction cost in the policy implementation process due to lower administrative transparency. In addition, when the cross-border financial externality is higher, international policy coordination is more likely because the gains from coordination dominate over the gains from deviation from coordination.

The results obtained in this study implicate that an effort to arrange an effective international policy coordination mechanism is essential to fix financial market failure due to cross-border externalities with informational barriers. However, the introduction of an effective international policy coordination mechanism is more likely among countries that have far-sighted policy approaches with stable political regimes. Moreover, coordination between countries with more integrated financial markets, and higher administrative transparency, which can reduce policy

distortions, are more likely to be sustained. Therefore, efforts to form a financial coordination mechanism should commence between countries with higher political stability and transparency and more integrated financial markets. This implies that efforts to form an international coordination mechanism among asymmetric countries with political instability and high administrative transaction costs are highly likely to end up in disappointment.

An extension and elaboration of the global game structure that explicitly shows the formation of herd behavior and default crises as liquidity crises due to reciprocal informational barriers would provide more detailed insight into international financial policy coordination mechanisms under bilateral informational barriers. These remain as a major issue for further research.

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<Abstract in Korean>

김영한*

이 논문은 금융시장에서의 국경간 외부효과가 금융기관들의 도덕적 해이에 미치는 영향을 분석하고, 이러한 국경간 외부효과에 의하여 초래되는 시장실패의 보완책으로서 국제정책조정체계의 실효성 및 그 조건을 분석하였다. 먼저 금융시장에서 국경간 외부효과는 금융기관들의 자산건전화 노력을 감소시킬 수 있음을 보이고, 또한 금융정책의 국제정책공조가 이루어질 경우, 국경간 외부효과에 의한 도덕적 해이를 억제할 수 있음을 보여준다.

또한 금융정책결정자가 정책결정메커니즘에서의 할인요인이 작을 경우, 즉 근시안적인 정책접근을 할 경우에는, 단기적 이윤추구를 극대화하는 은행의 정치적 영향력이 상대적으로 높을수록, 금융시장의 국제정책공조는 더욱 어려움을 보여주고 있다. 또한 정책결정 및 집행과정에서의 거래비용이 작을수록, 그리고 국경간 금융시장의 통합 정도가 높을수록, 금융시장에서의 국제정책공조가 유지될 수 있는 개연성이 높음이 확인되었다. 위의 결과는 상대적으로 정책집행과정의 투명성이 높고, 정치적 안정도 및 연속성이 높으며, 금융시장의 통합도가 높은 국가들간에 국제금융정책조정 메커니즘이 우선적으로 적용될 때, 실질적이고 효율적인 국제정책조정이 가능함을 시사하고 있다.

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338	기혼여성의 맞벌이 결정요인 분석(2008.6)	김우영
339	제조업과 서비스업간 기술진보 확산효과 분석(2008.8)	박성욱
340	The Cost Channel Effect of Monetary Policy in Korea(2008.8)	Myung-Soo Yie
341	해외 공급충격과 개방경제의 최적 금리준칙(2008.8)	김근영
342	고용보호제도 변화가 노동시장에 미치는 영향 분석(2008.8)	문의솔
343	장·단기 금리격차의 생산갭 예측력 분석(2008.9)	이명수
344	고용구조의 변화와 학력별 임금격차(2008.9)	김우영
345	임금근로자의 하향취업 행태 분석(2008.9)	이찬영
346	Estimation of Hybrid Phillips Curve in Korea(2008.9)	Woong Kim
347	Can the European Monetary System Be a Model for East Asian MonetaryCooperation?(2008.10)	Hyoung-kyu Chey
348	주택 가격지수 산정 - 서울 아파트 실거래가격을 이용한 실증연구(2008.10)	KAIST 금융공학연구센터
349	2008년 한국은행 국제컨퍼런스 결과 - Recognizing and Coping with Macroeconomic Model Uncertainty in Designing Monetary Policy(2008.10)	한국은행 금융경제연구원
350	소비자물가에 대한 유가 및 환율충격의 비대칭성·비선형성 분석(2008.11)	김기호·윤성훈
351	불완전 환율전가하에서 환율이 상품수지에 미치는 영향(2008.11)	윤성훈·김귀정
352	Inflation Volatility and Stock Returns: Some International Evidence(2008.11)	Ky-hyang Yuhn·Sang Bong Kim
353	외환시장압력과 국외부문 통화공급 변동의 관계 분석(2008.11)	김용복
354	통화적 물가결정이론으로 본 장기균형물가와 인플레이션(2008.11)	김배근
355	물가·성장간 관계변화 분석(2008.11)	송승주

356	The Impact of Foreign Bank Penetration on the Transmission of Monetary Policy in Emerging Economies: Evidence from Bank-level Data(2009.1) Ji Wu·Alina C. Luca·Bang Nam Jeon	
357	국가별 금리차의 요인분해(2009.1)	유복근
358	글로벌 구조 VAR 모형을 이용한 해외충격의 과급효과 분석(2009.1) 김윤영·박준용	
359	통화옵션을 이용한 미래 원/달러 환율의 위험중립 확률분포 추정(2009.1) 이승환	
360	통화정책과 주식수익률의 관계에 대한 실증분석과 시사점: 한국의 경우(2009.2) 이상규·김양우·우준명	
361	기업의 자금조달 수단과 대출경로(2009.2)	김준한·이명수
362	지적재산 보호와 경제성장(2009.2)	박성욱
363	Opening to Capital Flows and Implications from Korea(2009.2) Kyungsoo Kim, Byoung-Ki Kim and Young Kyung Suh	
364	최근 고용여건 변화와 청년실업 해소방안(2009.2)	박강우·홍승제
365	Market Structure, Bargaining, and Covered Interest Rate Parity(2009.2) Byoung-Ki Kim	
366	한국노동패널자료를 이용한 가계부채 분석(2009.2)	김현정·김우영·김기호
367	우리나라 기업의 가격결정행태 분석(2009.2)	김웅·홍승제
368	The Impact of Affinity on International Economic Integration: The Case of Japanese Foreign Direct Investment(2009.3)	Hyoung-kyu Chey
369	한국경제의 구조변화와 생산성: Baumol 효과를 중심으로(2009.3)	오완근
370	제조업과 서비스업의 기술진보 격차가 고용에 미치는 영향(2009.3)	김배근
371	The Estimation of Capital Stocks, Total Factor Productivity and Potential GDP(2009.3) Hak K. Pyo·Sunyoung Jung	
372	Does the Liquidity Effect Guarantee a Positive Term Premium?(2009.3) Kyuil Chung	

373	개별가격변동과 통화정책(2009.3)	박강우
374	우리나라에서의 디플레이션 발생 위험 평가(2009.3)	김웅
375	Labor Market Frictions and Wage Contracts(2009.3)	문외솔
376	채무 만기연장에 관한 게임이론적 분석(2009.3)	정형권
377	개인저축률과 거시경제변수간 관계분석(2009.3)	송승주
378	환율변동이 실물경제에 미치는 영향(2009.4)	김용복·곽법준
379	가계채무구조와 사교육비 지출 행태(2009.4)	이찬영
380	가계부채의 결정요인 분석(2009.4)	김우영·김현정
381	Are Structural Parameters of DSGE Models Stable in Korea?(2009.4)	Jiho Lee
382	Double Drain, Risk of Recession and Monetary Policy in Small Open Economies(2009.5)	Geun-Young Kim
383	A Way Forward for Asian Bond Market Development(2009.5)	Hong Bum Jang·Suk Hyun
384	개방경제의 실질소득지표에 대한 연구(2009.6)	김배근
385	실물·금융변수와 주택가격간 동태적 상관관계 분석(2009.6)	손종칠
386	은행의 비이자영업 확대와 시스템 위험(2009.6)	김기호·윤성훈
387	2009년 한국은행 국제컨퍼런스 결과 - The Credit Crisis: Theoretical Perspectives and Policy Implications(2009.6)	한국은행 금융경제연구원
388	낙인효과(stigma effect)와 자본이동성이 국채 CDS 프리미엄에 미치는 영향(2009.7)	김용복
389	Comparative Advantage and Labor Market Dynamics(2009.7)	Weh-Sol Moon
390	투자자의 시장심리를 반영한 자산가격 변동요인 분석(2009.8)	김윤영·이진수
391	주가와 채무구조 정보를 이용한 기업부문 신용리스크 측정(2009.8)	이승환
392	직접투자 유출입이 경기동조화에 미치는 영향(2009.8)	황광명

393	은행부문의 통화불일치 평가와 발생요인 분석(2009.8)	서영경·김근영
394	Covered Interest Rate Parity: A Model of Cournot Competition and Bargaining with Outside Option(2009.9)	Byoung-Ki Kim
395	The Determinants of Informal Sector and Their Effects on the Economy: the Case of Korea(2009.9)	Donghun Joo
396	산업간 지식전파효과 분석 : 사업서비스를 중심으로(2009.9)	김현정
397	우리나라 노동시장의 이력현상 분석(2009.9)	김웅
398	다부문 경제성장모형에 의한 수출주도형 성장전략 평가(2009.9)	김배근
399	최적필터(optimal filter)를 이용한 우리나라 주가지수의 확률변동성 및 점프 추출(2009.9)	윤재호
400	사회후생 극대화를 위한 국가채무 수준에 대한 연구(2009.10)	임진
401	중고령자의 은퇴결정요인 분석(2009.10)	손종철
402	금융 시스템리스크를 감안한 금융기관 자기자본 규제정책(2009.10)	서상원
403	Financial Integration in East Asia: Evidence from Stock Prices(2009.10)	Xiaodan Zhao-Yoonbai Kim
404	'Sleeping with the Enemy' or 'An Ounce of Prevention': Sovereign Wealth Fund Investments and Market Destabilization(2009.10)	April Knill-Bong-Soo Lee-Nathan Mauck
405	Fluctuations in Exchange Rates and the Carry Trade(2009.10)	Kyuil Chung-Oscar Jordà
406	실물경기변동모형에 의한 경기침체 요인분석(2009.11)	송승주
407	1930년대 세계대공황과 2008년 위기(2009.11)	양동휴
408	국내외 금융시장의 연계성 변화 분석 : 외환위기와 글로벌 금융위기 기간을 중심으로(2009.11)	유복근·최경욱
409	Global Economic Recession and East Asia: How Has Korea Managed the Crisis and What Has It Learned?(2009.11)	Yung-Chul Park
410	가구패널자료 접속을 통한 가계의 유동성제약 변화 연구(2009.11)	김기호
411	자본유출입의 경기순응성과 파급경로(2009.12)	송치영·김근영

412	기업 혁신역량 강화를 위한 기업지배구조의 모색(2009.12)	장지상·이근기
413	소비구조 변화가 산업구조에 미치는 영향 - 인구구조 변화를 중심으로(2009.12)	황상필
414	Macro Prudential Supervision in the Open Economy, and the Role of Central Banks in Emerging Markets(2010.2)	Joshua Aizenman
415	Risk-Factor Portfolios and Financial Stability(2010.2)	Gus Garita
416	신용마찰의 경제환경 하에서의 통화정책에 대한 연구(2010.2)	정용승
417	은퇴와 가계소비간 관계 분석(2010.2)	윤재호·김현정
418	Measuring Systemic Funding Liquidity Risk in the Interbank Foreign Currency Lending Market(2010.2)	Seung Hwan Lee
419	선물환시장의 효율성과 무위험금리차(2010.2)	황광명
420	금리정책 동조화의 경로 분석(2010.2)	임진·서영경
421	외국자본 유입이 경제성장에 미치는 영향(2010.3)	김승원
422	횡단면분포 특성을 이용한 기업의 경기반응 분석(2010.3)	김웅
423	경제성장과 사회후생간의 관계(2010.3)	강성진
424	불확실성이 설비투자 결정에 미치는 영향분석(2010.3)	홍성표
425	소득불평등과 경제성장의 관계: Cross-country 비교분석(2010.3)	손종철
426	글로벌 금융위기와 재정거래차익 - 한국의 사례(2010.4)	유복근
427	Local Sharing of Private Information and Central Bank Communication(2010.4)	Byoung-Ki Kim
428	조건부 도산확률을 이용한 은행부문의 시스템리스크 측정(2010.4)	이승환
429	Optimal Discretionary Policy vs Taylor Rule: Comparison under Zero Lower Bound and Financial Accelerator(2010.4)	Donghun Joo
430	개방경제의 금리기간구조 분석(2010.5)	박하일
431	확률적 프론티어 모형을 이용한 중요소생산성 국제비교: 기술적 효율성을 감안한 접근방법(2010.8)	정선영

432	인구 고령화와 금융자산선택: 미시자료 분석을 중심으로(2010.8)	이상호
433	창립 60주년 기념 한국은행 국제컨퍼런스 결과 - The Changing Role of Central Banks(2010.8)	한국은행 금융경제연구원
434	은행 예대금리 행태 분석(2010.8)	윤재호
435	Managing Openness: Lessons from the Crisis for Emerging Markets(2010.10)	Barry Eichengreen
436	환율동학에 대한 기대와 통화정책의 유효성(2010.10)	김근영
437	Wage Inequality and the Efficiency of Workers in Korea, 1965 - 2007(2010.10)	곽승영
438	은행의 레버리지 행태와 유동성 창출(2010.10)	이승환
439	Theories of International Currencies and the Future of the World Monetary Order(2010.11)	Hyoung-kyu Chey
440	Regional Economic Disparity, Financial Disparity, and National Economic Growth: Evidence from China(2010.11)	J. Peng, Bong-Soo Lee, G. Li and J. He
441	인플레이션 타게팅에 관한 최근 논의(2010.11)	김병기, 송승주
442	An Empirical Evaluation of Two Financial Accelerator Mechanisms: the Balance Sheets Effects of the Bank versus Those of the Firm(2010.11)	Donghun Joo
443	유동성위험과 금융규제간의 관계분석(2010.11)	강종구
444	외환보유액이 단기외채 유입에 미치는 영향(2010.11)	김승원
445	저출산·인구고령화의 원인에 관한 연구: 결혼결정의 경제적 요인을 중심으로(2010.11)	이상호, 이상현
446	우리나라 GDP 성장률과 인플레이션율의 특징(2010.12)	오금화
447	국가간 포트폴리오 투자와 은행대출을 중심으로 살펴 본 글로벌 불균형의 현황과 관제(2010.12)	이현훈
448	International Policy Coordination Mechanism with respect to the Moral Hazards of Financial Intermediaries(2010.12)	김영한

* 금융경제연구 제1~200호의 발간목록은 제320호 이전 책자를, 제201~300호의 발간목록은 제421호 이전 책자를 참고하십시오.